

**Remarks Upon the North American HELIOTHINAE and Their Recent Literature.**

BY A. R. GROTE.

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PREFACE.

I was engaged in a study of the *Calpinæ* (m.), *Stiriinæ* (m.), *Plusiinae* (m.), and *Heliothinae* (m.), contained in Mr. Neumogen's collection, my MMS. being in part in printer's hands, when a paper appeared on the *Heliothinae* by Mr. John B. Smith, based partly on specimens from Mr. Neumoegen's collection. It anticipated to some extent the changes I had found necessary since the publication of my new Check List. *Hel. Lucens*, which I stated in my List was not a *Heliothis*, I had associated with *Meadii*. I found that I had not understood Gueneé's genus *Tamila* and that its type was a *Lygranthoeccia*. In fact until now I had not examined it, or even possessed a specimen of *nundina*. I found that the character of mixed scales and hair was shared by other genera and that my *Tamilæ* belonged to different genera. So far my own discoveries went. Mr. Smith now farther interestingly shows us that we have the European genera *Sympistis* and *Heliaca* in our fauna, and that the *Oregona* of our collections is the same as the European *Ononis*. Omitting *Anarta* and *Lepipolys*, he rejects only four species from the group as defined in the new Check List and adds two, placed by me in the succeeding subfamily.

The principal mistake which Mr. Smith makes is the assumption that my Lists are monographic, and that I have reviewed all the genera and species therein enumerated. A table of a part of the *Heliothinae* was published by me in 1874; except that, I had gone no farther than describing the species as they came up from time to time. Twenty-five years ago, when I commenced to study, we had less than a dozen named species of *Noctuidæ* in American collections, now we have about fifteen hundred. The most of them I have described. After my visit, in 1868, to Europe, I originally applied the natural characters used in German works by Lederer and others, translating the terms. I believe I am the first to call the corneous plate at the base of the clypeus, the "infra-clypeal plate;" I translated Lederer's term "Wimpern" by "lashes."

Recently Mr. Smith criticised in Can. Entomologist my diagnosis of a Deltoid genus by saying I did not state whether the eyes were naked or not. I replied that all Deltoid genera had naked eyes. Mr. Smith then answered that my statement gave a wrong impression, because some genera had them lashed! He, therefore, did not then know that the term "naked" applied to the surface of the compound eye itself and that the lashes were the fringe around the orbit, that eyes could be naked and lashed (*Homohadena*), or hairy and unlashed!

I have given the full terminology of the characters of the *Noctuidae* in my writings. Mr. Smith uses precisely these characters. It should have struck him that our results would, under these circumstances, nearly coincide. And that I could not have examined the material where these characters were at variance with the classification adopted. In fact, while my Lists are the result of my studies, I have expressly stated that I brought our fauna into a general correspondence with the European and that in details much work remained to be done. In the following paper I have discussed some of Mr. Smith's criticisms. In the Republic of Science every one is bound to state facts and it is his duty to do so. But, as in any other social republic, the laws of conduct should be respected. It is nowhere necessary to be unfair and prejudiced. I can show that Mr. Smith has transgressed in this way in his paper. He has been unfair in concealing that his synonymy is taken from me, that his generic types are those laid down by me in my List of 1874. He does not credit me with the separation of *Melicleptria* with *cardui* as type, nor does this matter that he takes out one or two species. Above all he ignores the fact that I have gradually established certain genera and species and had no opportunity of comparing all the European genera. In a difficult group where many types were uniques and left my hands after description, it was to be expected that changes would be made when all were compared. Many intermediate forms came up from time to time and necessitated changes. So bent is Mr. Smith to cavil, that he brings up the fact that in establishing the genus *Helionche* ten years ago, I first called the tibiae non-spinose, and that I properly corrected it immediately afterwards by finding them armed. Why such a fact should be repeated I am at a loss to know. Mr. Smith is unjust when he says my course with *volupia* is "scarcely honest." The facts are these: I identified Dr. Fitch's *volupia* hesitatingly. Dr. Fitch's description contradicts my insect in color of hind wings and details of markings. I could not be sure of my determination; in fact, I am astonished now to hear that I was right and that my insect corresponds with Dr. Fitch's type. After twice describing and

once figuring it, associating Dr. Fitch's name with the species and giving my doubts, I finally became convinced that, as more pink *Heliothids* turned up in the West, I might be wrong and, to avoid a new name, proposed in the Brooklyn Bulletin that, if I was wrong, the insect should still be called *volupia*, Gr. I catalogued it thus until the fact could be substantiated (as it now is) and Mr. Smith accuses me of dishonesty! And by figuring and redescribing it, it is I, after all, who have made *volupia* known. I described *nobilis* from specimens brought by Mr. Ridings from Colorado about seventeen years ago; I figured it and since then never identified it in any paper, nor to the best of my recollection ever saw or determined it again. On the strength of somebody's specimens from Texas named "*nobilis*," which turn out to be different, Mr. Smith quotes *nobilis*, Gr., as a synonym, and gives the unfounded impression that I had mixed up two species as "*nobilis*," of which I am completely innocent. His citation could only be warranted had I in print described a wrong insect as "*nobilis*, Gr." Out of about 100 species of *Heliothinae*, I have described about fifty, four of which Mr. Smith rejects as color varieties, but quotes them as synonyms.

Mr. Smith says he supposes he will have to wait till "accident turns up" my *H. pictipeunis*, which I have given a beautiful and exact figure of, as well as a complete description. He passes over a number of much more doubtful species without a word to contradict my statement that my *Limbalis*, which he does not know, is not allied to *Marginata*, but to *Arcifera*, by saying that it must be near Mr. Edwards' *Constricta*.

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## REMARKS.

Taking Mr. Smith's paper on the *Heliothinae* only from its scientific side and treating it as an advance in our knowledge of the North American species, which I am perfectly willing to do, the following remarks may be of assistance: Of my own species not known to Mr. Smith, *Stilla* is undoubtedly a valid and most beautiful species, congeneric with *Angulata*, and Professor Snow has the type. I wish that Mr. Smith would follow Dr. Speyer and take *Pyrrhia* for this genus. *Chariclea* is not a pure assemblage as defined by Lederer; its type is *Delphinii* and as my *Pernana* is not congeneric, we have yet no North American *Chariclea*. I have referred *Cirrhophanus* to the *Stiriinae*, perhaps a

sub-group of *Plusinae*. *Rectifascia* is congeneric with *Gulnare*, but a smaller species; I have only one example, but both go out of the present group.

*Coercita* is a very pale species allied to *Separata*. I noted a difference in the tibial armature, which made me describe it as distinct. *Limbalis* is a beautiful little species, much smaller and not resembling *Constricta*, except superficially, and very near to *arcifera*, whereas *Constricta* is colored like *Rivulosa*. *Hoyi* falls away to *Leucobrephe*; my type, as explained, was defective. *Snowi* is so like the figures of *Rhodites* in the shape of wing and thickness of body, and agrees, except in one point, as noted by me, with Lederer's diagnosis, that I cannot believe it to be an *Alaria*; *Pallens* also does not quite agree. It is figured and perhaps Prof. Snow has an example. The ♂ type of *Bessula* (rubbed) is in Prof. Snow's collection. I differ as to the citation of varieties *Luxuriosa* and *Californiensis* as synonyms. They are both free from the white shading which is spread over the primaries on typical forms and have quite a distinct look. As they are geographical in distribution it is nonsense to overlook them. *Luxuriosa* has the lines also very fine and it looks very much like a different species at first sight. The same may, perhaps, be said of the varieties of *Separata*. The synonymy of the species of *Heliothis* I suggested myself (in fact, except the varieties of *Separata* and *Persimilis*, the synonymy has all been first stated by myself). The varieties of *Arvalis* are less marked than *Californiensis* and *luxuriosa*; they are mere accidental variations (*ochraceus*) in color, or obliterations (*amplus*) of the paler lines and shades. As to *M. Persimilis* I figured it because it differed from all my *Pauxilla*, and I am unwilling to draw it in without more evidence than Mr. Smith gives.

So far as the forty-six species of mine are concerned Mr. Smith knows all but ten. Of these, *Hoyi* and *Rectifascia* being ruled out, there exist good colored figures of *Pictipennis*, *Miniana* and *Snowi*, which can leave no doubt as to the species being valid and belonging here. Of the remaining five there is no doubt in my mind that *Limbalis*, *Stilla*, *Luxa*, are good species correctly placed. With the now proved variability of *Separata*, I commence to have a doubt as to *Coercita* being distinct; specimens from the locality will decide. Finally, the tenth, *Notatella* is Mr. Hulst's *Magdalena*. I regarded it, notwithstanding its *Cucullia*-shaped wings, as a *Heliothid*, but I only had one unset example and have none to compare again. As it is known, it is a matter of little immediate consequence, my desire being to have my species understood.

Dr. Speyer at some length records the difference between my *Angulata* and *Umbra* and regards them as different. Why, if our *Experimentis* is *Umbra*, is it that this variety does not occur in Europe? I do not understand the grounds upon which Mr. Smith calls *Angulata* a variety of *Umbra*, and they are not stated satisfactorily. I had also two or three *Rufimedia* and they looked very different from my Texan *Meskeana*. I do not feel certain that they are the same, but if any error has happened it can be easily detected; certainly Mr. Smith should know with Mr. Hulst's type specimen before him and I am willing to accept the fact. I compared Mr. Hulst's species with *Meskeana* and thought it different. Specimens (types) of both are in B. M. coll. So far as the species go, the above will explain my divergencies from Mr. Smith's views which are slight or rather, since he adopts the most, the debateable points between us may be said to be few. Following Staudinger, I have only adopted as named varieties forms equivalent to what he calls varieties in the European fauna. Where the name only expresses a slight change and one of the usual form of the species, I put it as a synonym in italics. With regard to the genera Mr. Smith does not include my *Oxygenemis advena* or *Rhodosea Julia*, which are valid genera in my opinion. I think, when Mr. Smith knows them, he will share my views; he probably did not know of their publication.

#### **RHODOSEA, Gr.**

Eyes full, naked, unlashd; anterior tibiae shortened, with a longer inner and shorter outer terminal claw, else not spinose; front very bulging; infra-clypeal plate pronounced, exceeded by the third joint of the palpi; tibiae unarmed, and this character separates the moth from *Alaria*. The wings are elongate, shaped as in *Heliophila* somewhat, but apices blunt and rather narrow; vestiture hairy; antennae simple. The moth is our most beautiful Helioid. The wings are entirely of a dead pink, like that of *Florida*, with a longitudinal yellow discal dash, and marked at base with yellow and with yellow fringe and edges to the primaries; hind wings pale, with faint dusky border; head and legs and thorax in front flushed with pink; thorax behind yellow; beneath the primaries are clouded centrally with fuscous, with the discal streak repeated; costal region and apices rosy. Expands 36 millim.

1. *JULIA, Gr.*—New Mexico.

#### **TRIOCNEMIS, Gr.**

The essential characters of this genus are the form of tibial armature and the posterior thoracic tuft. The genus is first discarded, then adopted by Mr. Smith, with the observation that my description (which he copies

in part) is superficial. I give the principal characters and those added by Mr. Smith are the superficial ones. *Axenus* is also called a bad genus by Mr. Smith, and now appears as good and even belonging to a different subfamily. Mr. Smith is vacillatory and hard to please.

### LYGRANTHOECIA, G. & R.

Type: *Crambus marginatus*, *Haw.*

In the Buffalo Bulletin, 1874, in my partial list of genera of this group, I gave the extension of this genus which I used in my Check List (1875). It is only enlarged now by Mr. Smith by adding to it the single species of *Tamila* and *Oria*, and others from different genera which do not change my conception of it in 1874 and subsequently. It replaces *Anthoecia*, which has a different type. I cannot understand what induced Mr. Smith to call it *Schinia*. I am the only author to use *Schinia*, and I took it for the three species so called by Hübner, who does not give any characters, and the adoption of his term at my expense shows that Mr. Smith abandons his acknowledged principles. I am the first to describe the fore tibiae of the type, and my only error, if it is one, is that I believed that modifications of tibial armature would give generic characters, and so I retained and described as distinct *Tricopsis* for the satiny white forms, and retained *Euleucyptera* for *cumatilis*, describing the anterior tibial armature. This genus might be called *Tamila*, because its type is shown by Mr. Smith to belong here. But that term rests only on one species and Gueneé does not note its relation to his *Anthoecia*. The first mistake is really made in the "Species Général." Although I made many changes with Gueneé's Hadenas, Mamestras and Agrotids, rearranging the species by their natural characters, I drew in but few genera and almost everywhere I allowed the genera to stand. I did this partly because I was under the impression that ultimately more genera would be recognized, and it was important to keep the synonymical meaning of the old terms from being lost; secondly, because my work had not yet got to the stage where I had the species all described and was ready to monograph the family. It is absurd of Mr. Smith to assume now, in monographing a small group of about 100 species, of which I have discovered about one half, that I should have exhausted inquiry which covers all the species described by other writers. It is assumed by him that my list is a minute study, such as I have made of the small forms related to *Erotyla*, and I am made responsible for the genera of my predecessors. But I had done enough, as far as I pretended to go, when I brought the genera approximately into their proper sequence, and had sifted the species so that the inconsistencies of former



workers on our Noctuids were to some extent avoided and rectified. My Hadenas have naked eyes, my Mamestras hairy ones, my Agrotids spinose tibiae. I have recognized the presence of important genera such as *Oncocnemis* in our fauna, without the European species at hand which Mr. Smith now has in such profusion. Undoubtedly the work is now easier with all the determinations made. My school friends Mr. Graef and Mr. Tepper have gradually acquired most all the European species, and such a person as Mr. Smith can easily arise and go through the labor of examining their rich collections and getting our fauna in details into correspondence with the European. But with only a book before me and a specimen of the first North American *Oncocnemis*, it was not so easy to write with a feeling of certainty. To return to this genus, as it cannot be called *Anthoecia* (which is a different genus), it ought in justice to be called by the name I retained for the larger number of its species and which, moreover, is better sounding. I shall continue, therefore, to use the term *Lygranthoecia*, and simply refer the species of *Schinia* as congeneric with *L. marginata*. The use of *Thalpochanes* rests on similar grounds.

#### DISOCNEMIS, Gr.

In my notes on Mr. Neumogen's collection I made Mr. Henry Edwards' species *Belludonna*, the handsomest of the group, the type of this new genus, leaving *Oregona*, unrecognized by me as the same as the European *Ononis*, in *Melicleptria*. In describing *Melaporphyria* I noted the narrowed eyes, shared by this genus, but the present differs by the tibiae having two instead of three claws as stated by Mr. Smith. The two species are also alike in form of wing and aberrant from *Immortua* in this respect. The naked eyes are narrowed or ovate. The infra-clypeal plate is more marked in both species than in *Melaporphyria*. The head is less prominent. Palpi heavily fringed, rather short, and the vestiture is longer and more hairy than in my genus *Melaporphria*, with which the present generally agrees, as shown by Mr. Smith. The type is *Melicleptria Belludonna*, Hy. Edw.

#### TRICOPIS, Gr.

Mr. Smith uses characters given in my table in the Bull. Buf. Soc. as sectional. The produced infra-clypeal (as this term is used by me) plate and the peculiarity of tibial armature are held by me to be of generic importance. *Aleucis*, of Harvey, is said not to have the plate prominent and is, perhaps, a *Lygranthoecia*. When we have two characters in combination it is enough to give sanction to the genus which

differs also (except from *aleucis*) in ornamentation. In his work no new characters are used by Mr. Smith different from those employed by me, if I except the tarsal structure of *Meadii*, which escaped me. He has apparently very thoroughly carried them out over all described species, and corrected my error that *Tamila* was to be distinguished by its vestiture.

### HELIOTHIS, Hübn.

I suggested the identity of our species with the European, which Mr. Smith adopts and is, no doubt, right in this. My type (figured by Glover) of *Umbrosus* is the greenish, light colored, and not ochrey and mixed form. I have seen no European specimens like this, and it seems a well marked variety. I took several specimens in the cotton fields about Atlanta, flying in the daytime. None of my *Luteitinctus* correspond with the figure of *Maritima*, except in so far that the secondaries are yellow, but they are brighter and differently marked in the American examples I have examined. It seems to me a variation in the same direction, but not exactly equivalent.

Notwithstanding that two species are taken out and another added, it is evident that the genus is used in the sense which I intended by Mr. Smith. The same is perfectly true of *Melicleptria* as proposed by me with its type. Mr. Henry Edwards is the first to doubt the validity of my genus *Adonisea*, which I unwillingly merge into *Melicleptria*.

I had hoped that Mr. Smith would have known Mr. Strecker's species, but he knows fewer than I do and adopts all the synonyms of that author which I had detected. In so far Mr. Smith's paper is premature.

As I have shown, the *Stiriinae* are characterized by a short, subquadrate thorax, the patagia often relieved or deflected, usually untufted, the abdomen closely scaled, weak, tapering suddenly to anus. The palpi are distinguished by being weak, of unequal length, the third joint not long or distinct and pointed as in the *Plusiinae*. In the usually clawed fore tibiae they approach the *Heliothinae*, in the shape of wing they are in a measure intermediate between the *Culpinae* and *Plusiinae*. I have not found any characters which divide the group I call *Eustrotiinae*, composed of genera clustering about *Tarache* and *Eustrotia*. I cannot call this latter genus *Erastia*, because this latter term is used first by Hübner for a genus of *Geometridae*. The *Stiriinae* frequent flowers, and the extruded ovipositor of some genera makes it probable that some inhabit stems or fruit in the larval state. The metallic wings ally them to *Plusia*. None of my subfamily groups have exclusive characters. I



agree with Lederer except that I consider the *Bombyciæ* and *Brephidæ* as *Noctuidæ*, and am adverse to giving an independent family rank to these small assemblages of genera. I also believe that genera may be founded on comparative characters, and that we should not associate very different-looking insects because technically they agree in certain natural characters. If we can find a modification of these, this will support a genus which otherwise we might not erect. Still I have always relied on natural characters and nowhere have I considered that pattern, color or size are sufficient. Admitting that secondary sexual characters must be used in some lower groups to erect our genera upon, I cannot make an exception with *Heliochilus*, as I have elsewhere fully explained.

The four species which have become homeless through Mr. Smith's paper and must be transferred to other subfamily groups, I would arrange as follows:

**XANTHODES**, Guen.

BUXEA, *Gr.*—Texas.

**TRILEUCA**, Gr.

Eyes full, naked, unlashd; vestiture scaly; body untufted; tibiae unarmed; wings full; primaries unusually broad for this group; apices pointed, external margin straight. The colors are faded brownish ochrey, silky, shining; fore wings crossed by three pale, narrow upright lines, the outer angulate on costal region. The species are:

TRIFASCIA, *Gr.*—Southern States.

GULNARE, *Streck.*—Illinois.

**CHAMAECLEA**, Gr.

Front with a tubercle; tibiae apparently unarmed; body untufted; wings like *Stiria*. The genus is not unrelated to *Grotella*, and in colors oddly resembles the European *C. Delphinii*. I have figured it in my Illustrated Essay.

PERNANA, *Gr.*—Arizona.

*Note.*—In my revision of the *Stirinae*, etc. (Can. Ent.), I record this genus and its characters at length.

## LIST.

## HELIOTHINAE, m.

**LEPIPOLYS**, Guen.

- 1.
- perscripta*
- , Guen.

**ANARTA**, Ochs.

2. *myrtilli*, Linn.  
*acadiensis*, Beth.
3. *cordigera*, Thunb.  
*luteola*, G. & R.
4. *melaleuca*, Thunb.  
*bicycla*, Pack.
5. *melanopa*, Thunb.  
*nigrolunata*, Pack.
6. *quadrilunata*, Gr.
7. *subfuscata*, Gr.
8. *submarina*, Gr.
9. *schoenherri*, Zett.  
*leucocycla*, Staud.
10. *Richardsoni*, Curt.  
*algida*, Lef.
11. *promulsa*, Morr.
12. *nivaria*, Gr.  
*Mam. curta*, Morr.  
*Orth. perpura*, Morr.
13. *membranacea*, Morr. —
14. *lapponica*, Thunb.  
*amissa*, Lef.
15. *Zetterstedtii*, Staud.
16. *Kelloggii*, Hy. Edw.

**SYMPISTIS**, Hübn.\*

- 17.
- proprius*
- , Hy. Edw.

**MELICLEPTRIA**, Hübn. (Gr.).

18. *celeris*, Gr.
19. *pulchripennis*, Grt.  
*var. languida*, Hy. Edw.
20. *Graefiana*, Tepper.
21. *villosa*, Gr.  
*pauquilla*, Gr.
22. *persimilis*, Gr.
23. *honesta*, Gr.
24. *sueta*, Gr.  
*var. Californiensis*, Gr.
25. *vacciniae*, Hy. Edw.

**HELIOLONCHE**, Gr.

- 26.
- modicella*
- , Gr.

**HELIOSEA**, Gr.

- 27.
- pictipennis*
- , Gr.

**HELIACA**, H.-S.

28. *diminutiva*, Gr.
29. *fasciata*, Hy. Edw.
30. *dubitans*, Tepper.
31. *nexilis*, Morr.  
*elaborata*, Hy. Edw.

**MELAPORPHYRIA**, Gr.

- 32.
- immortua*
- , Gr.

**DISOCNEMIS**, Gr.

33. *prorupta*, Gr.  
*venusta*, Hy. Edw.
34. *belladonna*, Hy. Edw.
35. *ononis*, Fabr.  
*oregona*, Hy. Edw.

**PSEUDATAMILA**, Smith.

- 36.
- perminuta*
- , Hy. Edw.

22

- 37.
- vanella*
- , Gr.

**HELIOPHANA**, Gr.

- 38.
- mitis*
- , Gr.

**XANTHOTHRIX**, Hy. Edw.

- 39.
- ranunculi*
- , Hy. Edw.

**EUEDWARDSIA**, Gr.

- 40.
- Neumoegeni*
- , Hy. Edw.

**HELIOCHILUS**, Gr.

- 41.
- paradoxus*
- , Gr.

**HELIOTHIS**, Hübn.

42. *armiger*, Hübn.  
*var. umbrosus*, Gr.
43. *dipsaceus*, Linn.  
*phlogophagus*, G. & R.  
*interjacens*, Gr.  
*var. luteitinctus*, Gr.
44. *scutosus*, Fabr.  
*nuchalis*, Gr.
45. *rhexia*, A. & S.  
*spectanda*, Streck.

\* Not *Sympistes*, Smith.

46. *subflexa*, Guen. —

**PYRRHIA**, Hübn.

47. *umbra*, Hufn.

*exprimens*, Walk.

47½. *angulata*, Gr.

48. *stilla*, Gr.

**DASYSPOUDEA**, Smith.

49. *lucens*, Morr.

*var. luxuriosa*, Gr.

50. *Meadii*, Gr.

**PSEUDANTHOECIA**, Smith.

51. *tumida*, Gr.

**OXYCNEMIS**, Gr.

52. *advena*, Gr.

**TRIOCNEMIS**, Gr.

53. *saporis*, Gr.

**AEDOPHRON**, Led.

54. *pallens*, Tepper. —

55. *Snowi*, Gr.

**ALARIA**, West.

56. *gaurae*, A. & S.

**RHODODIPSA**, Gr.

57. *volupia*, Fitch.

58. *miniana*, Gr.

**RHODOPHORA**, Guen.

59. *florida*, Guen.

**RHODOSEA**, Gr.

60. *Julia*, Gr.

**NYCTEROPHAETA**, Smith.

61. *Magdalena*, Hulst. (Febr.)

*Epinyctis notatella*, Gr. (April.)

**PIPPONA**, Harv.

62. *bimatrix*, Harv.

**GROTELLA**, Harv.

63. *septempunctata*, Harv.

**ANTAPLAGA**, Gr.

64. *dimidiata*, Gr.

65. *sexseriata*, Gr.

**BESSULA**, Gr.

66. *luxa*, Gr.

**TRICOPIS**, Gr.

67. *chrysellus*, Gr.

68. *Hulstia*, Tepper.

??

69. *aleucis*, Harv.

**LYGRANTHOECIA**, G. & R.

70. *cumatilis*, Gr.

*sulmala*, Streck.

71. *trifascia*, Hübn.

71½. *bifascia*, Hübn.

72. *gracilentia*, Hübn.

*oleagina*, Morr.

*imperspicua*, Streck.

73. *velaris*, Gr.

74. *obliqua*, Smith. —

75. *nundina*, Dru.

76. *separata*, Gr.

*var. balba*, Gr.

*var. acutilinea*, Gr.

*var. ? Walsinghamii*, Hy. Edw.

76½. *coercita*, Gr.

77. *roseitincta*, Harv.

78. *lynx*, Guen.

79. *siren*, Streck.

80. *tertia*, Gr.

81. *albafascia*, Smith. —

82. *regia*, Streck.\*

83. *sanguinea*, Geyer

84. *cupes*, Gr.

*crotchii*, Hy. Edw.

85. *lupatus*, Gr.

86. *jaguarina*, Guen.

87. *Packardii*, Gr.

88. *mortua*, Grt. (Colorado).

89. *nubila*, Streck. (Tex.)

90. *nobilis*, Gr. (Colorado).

91. *errans*, Smith. —

92. *aroifera*, Guen.

*var. Spraguei*, Gr.

93. *limbalis*, Gr.

94. *brevis*, Gr.

*var. atrites*, Gr.

95. *inclara*, Streck.

96. *ultima*, Streck.

97. *tuberculum*, Hübn.

98. *bina*, Guen. —

99. *spinosae*, Guen.

*hirtella*, G. & R.

100. *Meskeana*, Gr.

*rufimedia*, Gr.

*fustidiosa*, Streck.

101. *parmeliana*, Hy. Edw. —

102. *marginata*, Harv.

*rivulosa*, Guen.

\* Referred by me to *Lygranthoecia*. I associated it with *Sanguinea* in coll. Neum.

103. *constricta* Hy. Edw.104. *Thoreaui*, G. & R.105. *saturata*, Gr.*rubiginosa*, Streck.106. *lanul*, Streck. —107. *gloriosa*, Streck. —**DERRIMA**, Walk.108. *stellata*, Walk.

var. maj. suff. suc.?

109. *Henrietta*, Gr.**AXENUS**, Gr.110. *arvalis*, Gr.*amplus*, Hy. Edw.*aberr. ochraceus*, Hy. Edw.**PSEUDACONTIA**, Smith.111. *crustaria*, Morr. —

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By the arrangement I have proposed the pale, often whitish form with the front bulging, infra-clypeal plate exposed (sometimes mainly at the middle as in *Rhodosea*) are placed at the end, as they approach the *Tarache*-like genera in some respects. The mossy-scaled, broad front of *Tarache* is intermediate between the clypeus of the *Heliothids* and that of *Eustrotia*. I am willing to place *Axenus* here, but I cannot understand why Mr. Smith at one time considers it a bad genus and not distinct from *Annaphila*, and then puts it into another subfamily? Could it only be shown how much is lost by unnecessary criticism, both to science and human happiness, I think it would be less generally indulged in. I have worked so long and on the whole to such plainly advantageous results to a knowledge of our *Noctuidae*, that I am rather entitled to a greater consideration. I assure Mr. Smith, in conclusion, that I shall view the results of his future work with pleasure and that, although this is my last reply to him, that I shall be glad to assist him in any way possible while the power to do so remains with me.